

# National Bureau of Standards

## Certificate of Analysis

### Standard Reference Material 291

#### Cr-Mo Steel (ASTM A-213)

Element	Certified Value <sup>a</sup>	Range of Reported Results <sup>b</sup>		
		P - e - r - c - e - n - t	b - y	W - e - i - g - h - t
Carbon	0.177	0.175	to	0.180
Manganese	.55 <sub>0</sub>	.546	to	.56
Phosphorus	.008	.008	to	.009
Sulfur	.020	.019	to	.021
Silicon	.23 <sub>0</sub>	.225	to	.237
Copper	.047	.046	to	.048
Nickel	.065	.060	to	.071
Chromium	1.33	1.32	to	1.35
Molybdenum	0.53 <sub>8</sub>	0.533	to	0.547
Aluminum (total)	.002	.0017	to	.004

<sup>a</sup> The value listed for an element is the present best estimate of the "true" value based on the results of the cooperative analytical program. The value is not expected to deviate from the "true" value by more than  $\pm 1$  in the last significant figure reported. For a subscript figure, the deviation is not expected to be more than  $\pm 5$ .

<sup>b</sup> Maximum variability from a minimum of four independent results (means).

The material for this SRM was obtained from the United States Steel Corporation, Duquesne Works, Duquesne, Pa.

Cooperative analyses for certification were performed in the analytical laboratories of the United States Steel Corporation, Gary Works, by E. W. Shipley, Geneva Works by G. K. Stewart, and Fairless Works by P. O. Ecelberger; and the Armco Steel Corporation, Research Center by M. Dannis and R. L. LeRoy.

Analyses for certification were performed in the NBS Analytical Chemistry Division by S. A. Wicks.

The overall direction and coordination of the technical measurements leading to certification by NBS were performed by J. I. Shultz.

The technical and support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Office of Standard Reference Materials by R. E. Michaelis.

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